

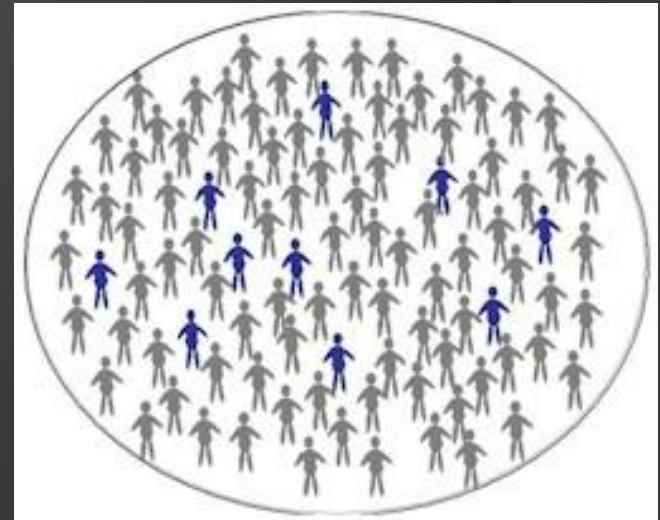
# VACCINE-PREVENTABLE DISEASE INVESTIGATIONS

## Why and How

Bureau of Epidemiology and Public Health  
Informatics

Kansas Immunization Program  
Kansas Department of Health and  
Environment

2011 Annual Conference



# Objectives

- Explain the purpose of disease investigation
- Identify available resources
- Understand the importance of collecting complete information
- Conduct case interviews

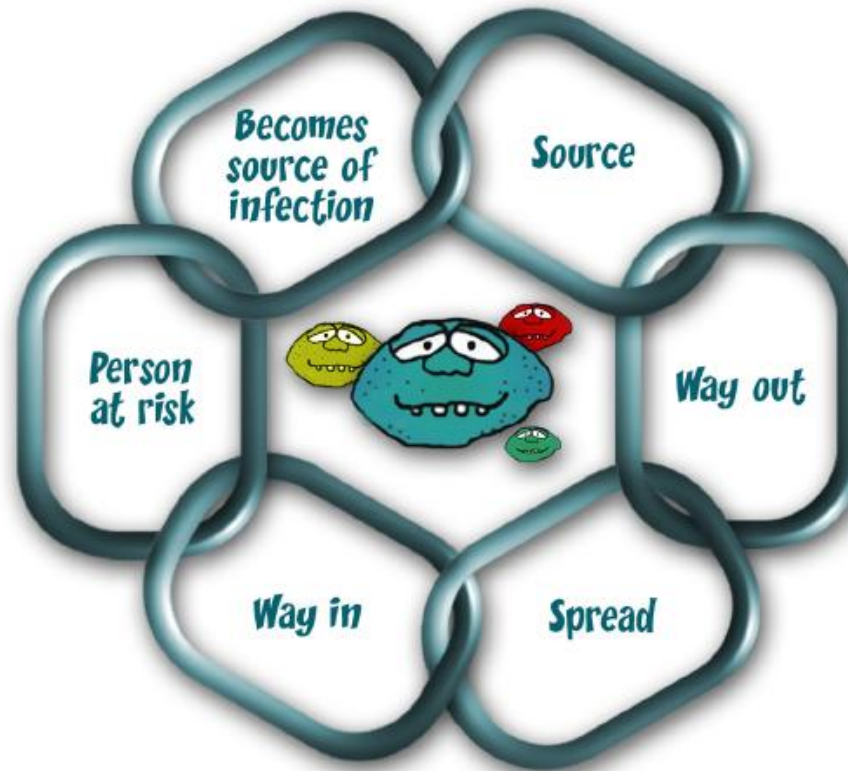
# Why Investigate?

- ◎ To prevent the spread of illness!
  - Trace disease source and spread
  - Identify outbreaks
  - Implement control and prevention measures
  - Gain information for policy, education
    - Used by state, CDC
    - Design disease control activities
    - Evaluate program, vaccine efficacy



# The chain of infection

All links must be present in the right order  
for an infection to occur



# Why Investigate?


- ◎ It's the law
  - KAR 28-1-2
    - “Designation of infectious or contagious diseases”
    - “Cases or suspect cases shall be reported within 7 days”




# Why Investigate?

- It's the law
  - KAR 28-1-2
    - Kansas Notifiable Disease List

**2006 REPORTABLE DISEASES IN KANSAS** for health care providers, hospitals, and laboratories  
(K.S.A. 65-118, 65-128, 65-6001 - 65-6007, K.A.R. 28-1-2, 28-1-4, and 28-1-18. Changes effective as of 4/28/06)

 - Indicates that a telephone report is required by law within four hours of suspect or confirmed cases to KDHE toll-free at 1-877-427-7317

 - Indicates that an isolates must be sent to: Division of Health and Environmental Laboratories  
Forbes Field, Building #740, Topeka, KS 66620-0001  
Phone: (785) 296-1633

Acquired Immune Deficiency Syndrome (AIDS)

Amebiasis

*Anthrax* 

Arboviral disease (including West Nile virus, Western Equine encephalitis (WEE) and St. Louis encephalitis (SLE)) - indicate virus whenever possible

*Botulism* 


Brucellosis

Campylobacter infections

Chancroid

*Chlamydia trachomatis* genital infection

*Cholera* 

*Measles (rubeola)* 

*Meningitis, bacterial* 

*Meningococcemia*  

*Mumps* 

*Pertussis (whooping cough)* 

*Plague (Yersinia pestis)* 

*Poliomyelitis* 

Psittacosis

*Q Fever (Coxiella burnetii)* 

*Rabies, human and animal* 

Rocky Mountain Spotted Fever

*Rubella, including congenital rubella syndrome* 



# But really, Why do we investigate?



# Steps to Prevent the Spread

1. Confirm the diagnosis



# Case Study #1

- Varicella positive 36 year old male
- LHD assumes shingles → no follow up done with the physician or individual

# Case Study #1 – Outcome

- Patient did have chickenpox
- Individual worked as a guard at a juvenile justice facility in the county
- Inmates continually being transferred to and from this facility
- Potentially hundreds of inmates exposed to patient that are now all over the state

# Steps to Prevent the Spread

1. Confirm the diagnosis
2. Conduct case interview
  - Implement control measures

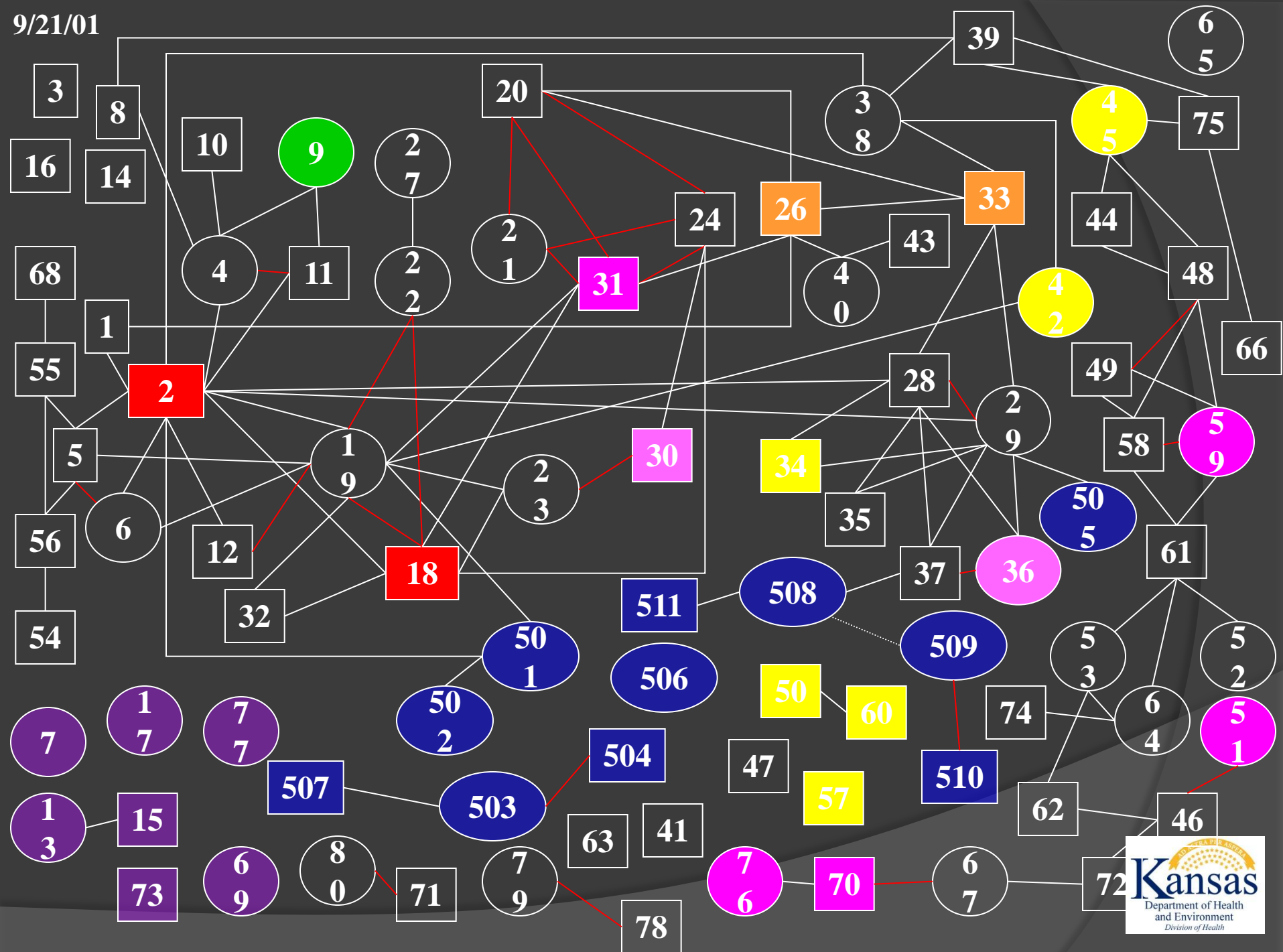
# Case Study #2

- Hepatitis A positive male
- Physician contacted, diagnosis confirmed
- LHD informed that patient is a known drug user
- Investigator is not comfortable associating with drug users and therefore does not conduct case interview

# Case Study #2 - Outcome

- ⦿ Turned into the largest documented outbreak of hepatitis A that Kansas has seen
- ⦿ Number of Cases: 90
- ⦿ Number of Contacts: 548
- ⦿ Doses of IG
  - Contacts: 401
  - Patron recall: 2800
- ⦿ Doses of vaccine
  - General public: 1550
  - High Risk: 187
  - Children: 392

**9/21/01**

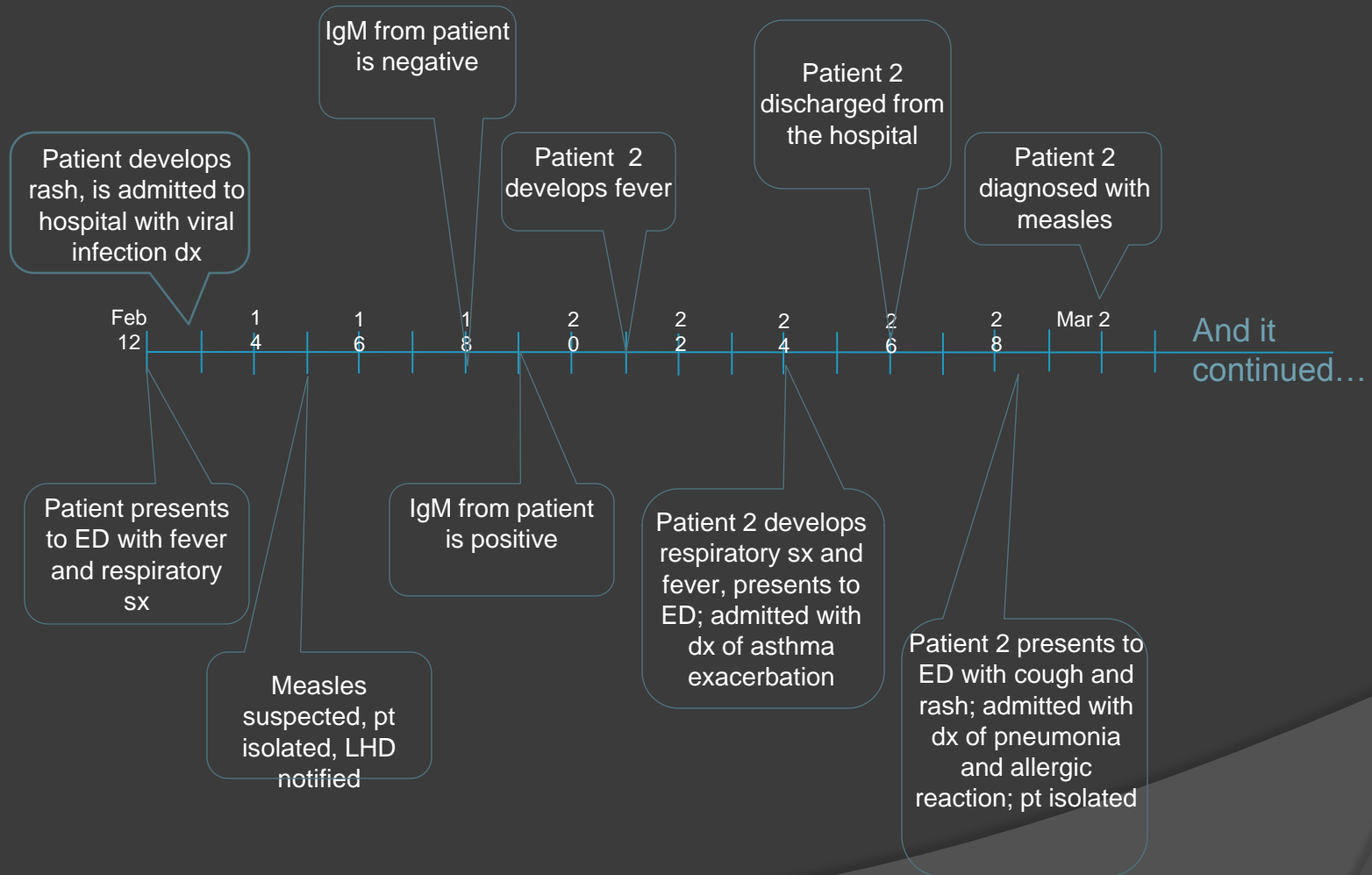


# Steps to Prevent the Spread

1. Confirm the diagnosis
2. Conduct case interview
3. Identify contacts
  - Implement control measures

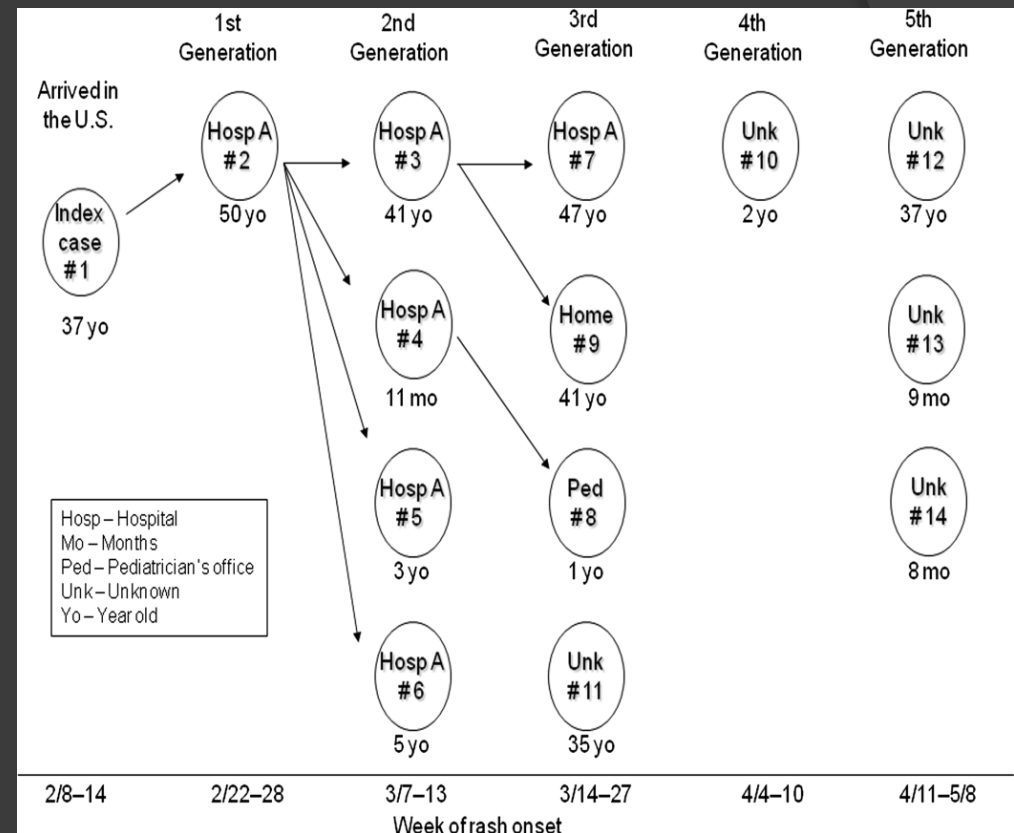


# Case Study #3



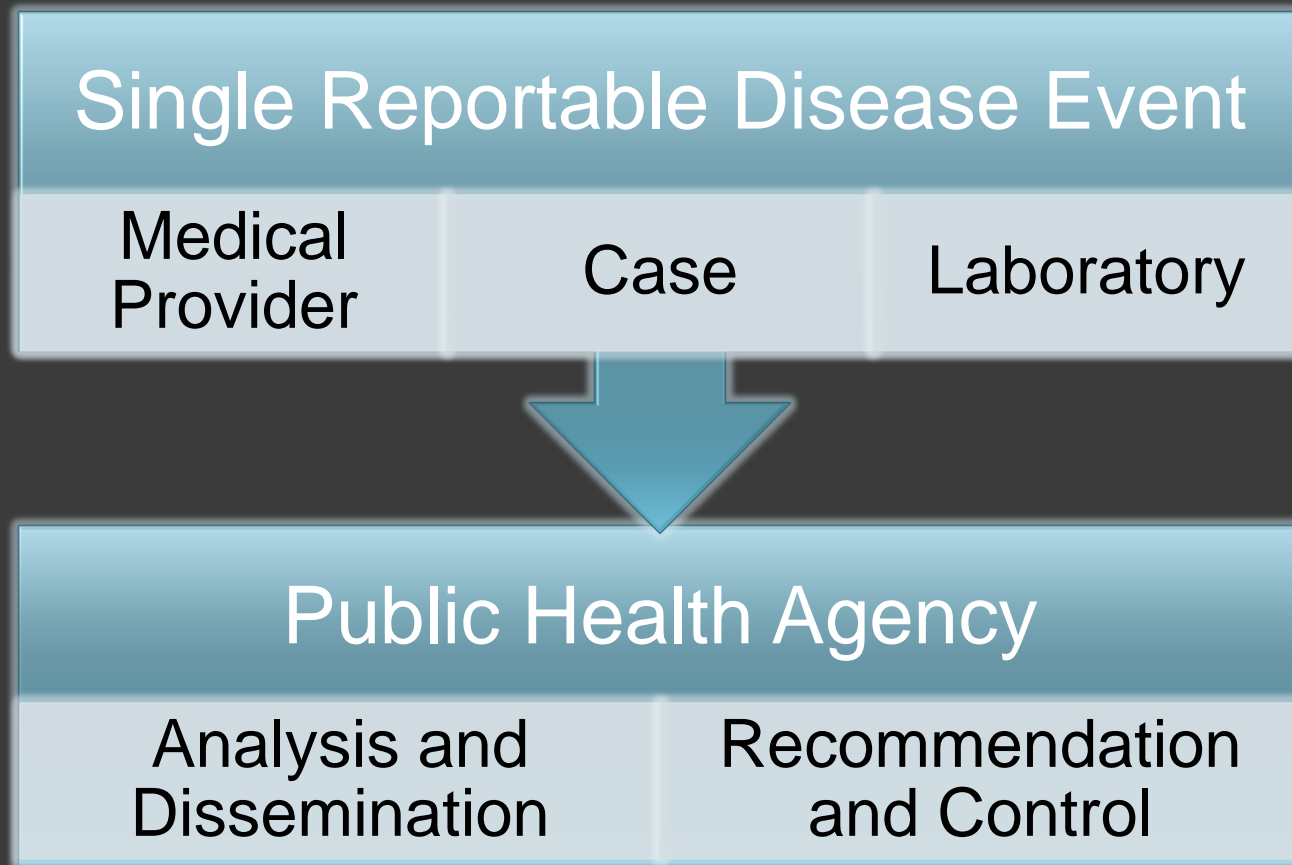
# Case Study #3 - Outcome

- ◉ Suspected Cases: 363
- ◉ Probable Cases: 8
- ◉ Confirmed Cases: 14
- ◉ ~15K h lost in furlough
- ◉ ~\$800K spent by the two hospitals

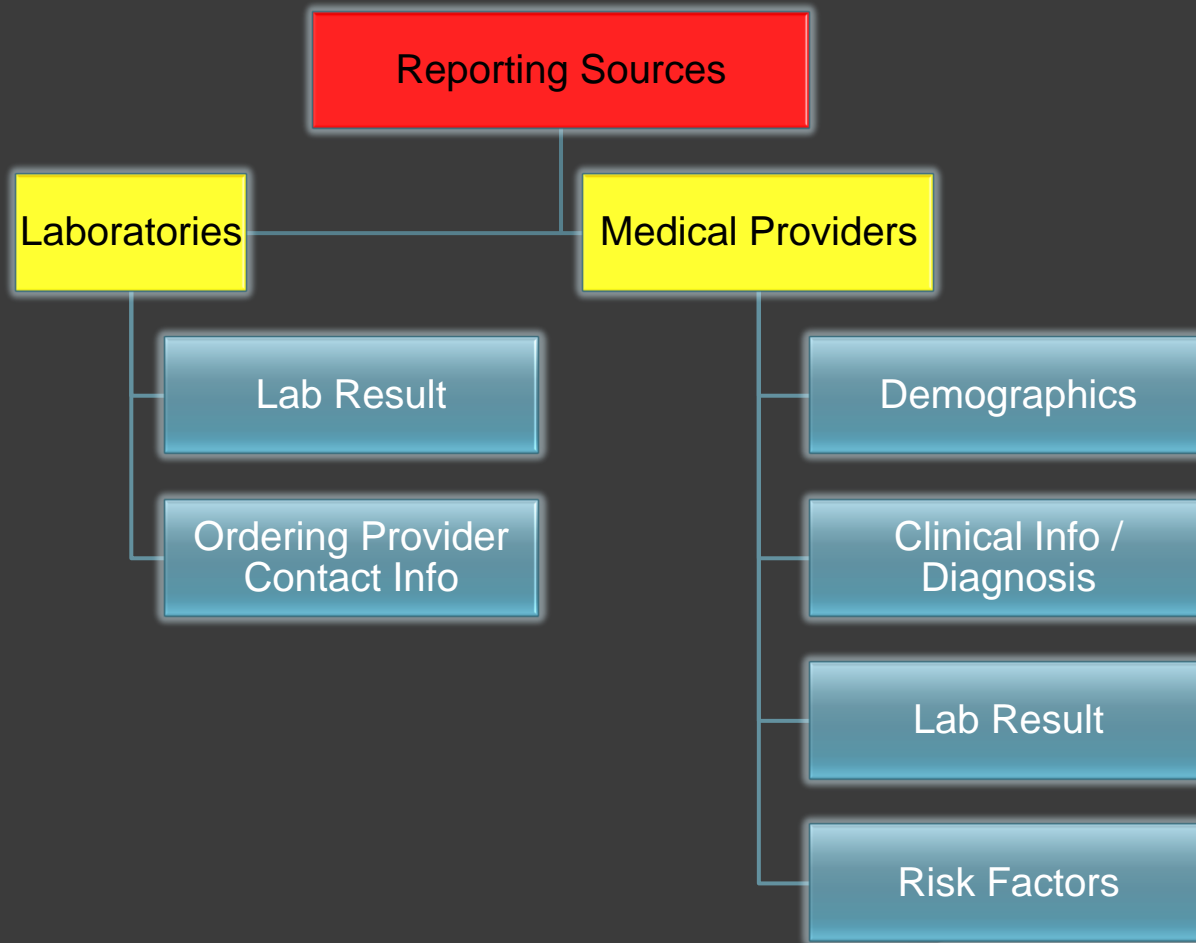


# Case Investigations

# Passive Surveillance



# Who Provides What Information?



# What information to collect

- ⦿ Resources —

- Disease Investigation Guidelines (DIGs)
- Disease specific information

- ⦿ Demographics

- ⦿ Clinical History

- ⦿ Lab test type and results

- ⦿ Risk factors

- Where infected
- Where spread

# Disease Investigation Guidelines

## Varicella (Chickenpox) Investigation Guideline

### CONTENT:

### VERSION DATE:

#### Investigation Protocol:

- Investigation Guideline 06/2010

#### Investigation Forms / Documentation Worksheets:

- General Investigation Form(s) 06/2008
- Varicella Supplemental Form 04/2009
- KS Varicella Reporting Form 06/2004

#### Supporting Materials found in attachments:

- Sample Letter, Parent Notification 07/2010
- Fact Sheet 07/2010

[http://www.kdheks.gov/epi/disease\\_investigation\\_guidelines.htm](http://www.kdheks.gov/epi/disease_investigation_guidelines.htm)



# DIGs – What is inside

- ⦿ Case Classification – Confirmed, Probable, Suspect
- ⦿ Lab analysis – what specimens to collect and when
- ⦿ Overview of the disease
- ⦿ Investigator responsibilities
- ⦿ Isolation and other control measures
- ⦿ Investigation Forms
  - Rapid assessment & contact investigation forms (VPDs)
  - General investigation form
  - Supplemental form – disease specific

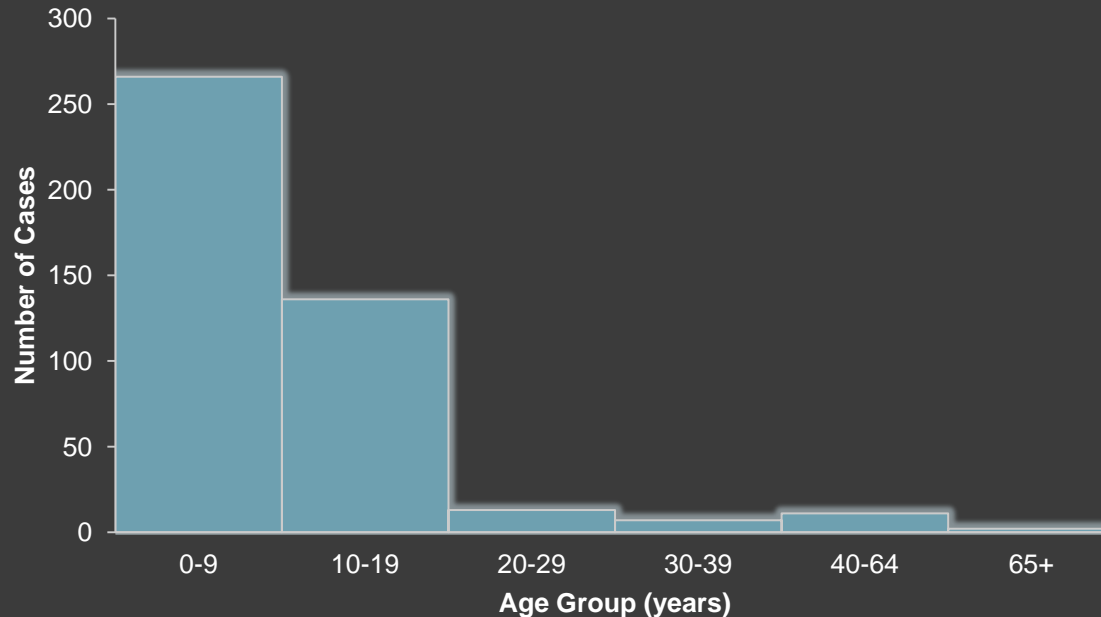
# Demographics

- Who they are
- Where they live, work

Patient Information		
Name Type: <input type="checkbox"/> Default/Common <input type="checkbox"/> Legal <input type="checkbox"/> Maiden <input type="checkbox"/> Nickname		
Last: _____	First: _____	Middle: _____
Street: _____	City/State: _____	Zip: _____
Evening Phone #: _____	Daytime Phone #: _____	
Sex: <input type="checkbox"/> Failure to Report <input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Other <input type="checkbox"/> Transsexual <input type="checkbox"/> Unknown		
Race: <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian <input type="checkbox"/> Black or African American <input type="checkbox"/> Native Hawaiian or Other Pacific Islander <input type="checkbox"/> White <input type="checkbox"/> Unknown		
Hispanic / Latino Ethnicity: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Date of Birth: _____	Age: _____	Age Unit: <input type="checkbox"/> Days <input type="checkbox"/> Weeks <input type="checkbox"/> Months <input type="checkbox"/> Years

# Demographics

Varicella Cases Reported in 2010  
by Age Group



- Sex
- Date of birth
- Race
- Ethnicity
- Address

# Clinical History

- Obtain clinical information from physician, nurse
- Symptoms collected varies by disease

Clinical Data			
<b>Any Rash?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	<b>Rash Onset Date</b> mm/dd/yyyy	<b>Rash Duration</b> 0-30 Days; 99=Unknown	<b>Rash Type</b> <input type="checkbox"/> Generalized <input type="checkbox"/> Localized/dermatomal <input type="checkbox"/> Unknown
<b>Immunocompromised?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown			
<b>Lesion Severity</b> <input type="checkbox"/> Mild (few scattered lesions on the body) <input type="checkbox"/> Moderate (number of lesions between mild and severe) <input type="checkbox"/> Severe (lesions numerous enough to almost touch, or normal skin is difficult to see between lesions)			
<b>Fever?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	<b>If Recorded, Highest Measured Temperature</b>		<b>Fever Duration</b> 0-30 Days; 99=Unknown
Complications			
<b>Pneumonia?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	<b>Encephalitis?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	<b>Cerebellar Ataxia?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	<b>Skin Infection?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
<b>Other Secondary Infection?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	<b>Thrombocytopenia?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	<b>Other Complications?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	<b>If Yes, Please Specify</b>
<b>Death</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		<b>If Death, Date</b> mm/dd/yyyy	

# Clinical History

- More than just symptoms!

Hospital Information	
Hospitalized: <input type="checkbox"/> Yes <input type="checkbox"/> No	Patient Status Date: _____
Hospital Name: _____	Hospital City: _____
Date Hospitalized: _____	Number of Days Hospitalized: _____

# Laboratory Testing

- Obtain from physician if lab report unclear
- If no symptoms, why was testing performed?
- Was testing performed at the appropriate time?

Lab Reports				
Laboratory Name: _____		Lab Report Date: _____		
Ordering Provider Name: _____		Phone: _____	Facility: _____	
Specimen Accession Number: _____		Specimen Collection Date: _____		
Organism Name: _____		Organism Species: _____		
Organism Serogroup: _____		Organism Serotype: _____		
<u>Additional Results Information</u>				
Reported Test Name:	Coded Result:	Text Result:	Numeric Result:	Comments:
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

# Risk Factors

## ● Vaccine history

Vaccine History			
<b>Vaccinated?</b> (Received varicella-containing vaccine?) <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		<b>Number of doses received ON or AFTER 1st birthday</b> <input type="text"/>	
Vaccination Date	Vaccine Type	Vaccine Manufacturer	Lot Number
mm/dd/yyyy	Select One	Select One	
<b>If Not Vaccinated, What was The Reason?</b> <div> <input type="checkbox"/> Religious Exemption           <input type="checkbox"/> Medical Contraindication           <input type="checkbox"/> Philosophical Objection         </div> <div> <input type="checkbox"/> Lab Evidence of Previous Disease           <input type="checkbox"/> MD Diagnosis of Previous Disease           <input type="checkbox"/> Under Age For Vaccination         </div> <div> <input type="checkbox"/> Parental Refusal           <input type="checkbox"/> Other, Specify <input type="text"/> <input type="checkbox"/> Unknown         </div>			



# Risk Factors

## ⦿ Travel history

### Travel History

1 <sup>st</sup>	Destination: _____	Depart Date: _____	Return Date: _____
2 <sup>nd</sup>	Destination: _____	Depart Date: _____	Return Date: _____
3 <sup>rd</sup>	Destination: _____	Depart Date: _____	Return Date: _____
4 <sup>th</sup>	Destination: _____	Depart Date: _____	Return Date: _____

# Transmission Settings

## Work / Occupation or School / Grade

Worksites / School: \_\_\_\_\_

Occupations / Grade: \_\_\_\_\_

## Epidemiologic Information

Epi-linked to Another Confirmed or Probable Case?

☐ Yes ☐ No ☐ Unknown

Case ID of epi-linked case

# Rapid Assessment Form

Varicella Rapid Assessment Form for the Local Investigator							
(Please refer to the Disease investigation Guideline for additional guidance.)							
SYMPTOMS(S)	Unk.	No	Yes	Onset Date	Duration (days)	Comments	
Rash						Rash Severity:	
- Rash Type: Generalized						<input type="checkbox"/> Mild (Few Scattered; < 50)) <input type="checkbox"/> Moderate (50-500 lesions) <input type="checkbox"/> Severe (> 500 lesions)	
- Rash Type Localized/ Dermatomal							
Fever						Highest Temp:	
COMPLICATIONS	Unk.	No	Yes	Date(s)	Location(s)		
Hospitalized							
Died							
Pneumonia							
Encephalitis							
Cerebella Ataxia							
Skin Infection							
Other Secondary Infection							
Thrombocytopenia							
Other Complications (Specify)							
MEDICAL HISTORY	Unk.	No	Yes	Date Arrive	Date Depart	Location (To / From)	
Immunocompromised							
History of Varicella							
Varicella Vaccination History	Unk.	No	Yes	Date(s)	Type	Manufacturer	Lot
Dose 1							
Dose 2							
If NO to either dose, reason:							
INITIAL EPI INFORMATION	Unk.	No	Yes	Date(s)	Location(s) or Case information		
School/Daycare/Camp association							
Contact w/ Varicella case							
LABORATORY TESTING	Unk.	No	Yes	Collection Date	Results		
Virus Isolation					Positive / Negative / Indeterminate		
DFA					Positive / Negative / Indeterminate		
PCR					Positive / Negative / Indeterminate		
Serum IgG (Convalescent)					Positive / Negative / Indeterminate		

# Contact Investigation and Control Measures

- ◉ Isolation
- ◉ Work, school, daycare restrictions
- ◉ Follow-up of cases
- ◉ Protection of contacts
- ◉ Environmental measures
- ◉ Education

# Why Isolate?

- ◎ It's the law
  - KAR 28-1-6
    - “Requirements for isolation & quarantine of specific...diseases”



# Why Quarantine

- It's the law

- KAR 28-1-6

- VPDs

- Chickenpox (varicella)
    - Diphtheria
    - Hepatitis A and Hepatitis B
    - Mumps
    - Pertussis
    - Polio
    - Rubella
    - Measles
    - Hib and meningococcal meningitis



# Purpose of Case Interviews

- ⦿ Identify infection source, spread
- ⦿ Activities during infectious period
- ⦿ Travel during infectious period
  - Measles transmission among air passengers has been documented
- ⦿ Contact tracing
  - Home, daycare, school, work



# Preparation – Know the Disease

- Epidemiology
- Reservoirs
- Modes of transmission
- Incubation period
- Period of communicability
- Susceptibility and resistance
- Treatment

# Resources

- ◉ Disease Investigation Guidelines

Available at

[http://www.kdheks.gov/epi/disease\\_protocols.htm](http://www.kdheks.gov/epi/disease_protocols.htm)

- ◉ Epidemiology and Prevention of Vaccine-Preventable Diseases

Available at

<http://www.cdc.gov/vaccines/pubs/pinkbook>

- ◉ Kansas Health and Environmental Laboratories

Available at

[http://www.kdheks.gov/labs/lab\\_ref\\_guide.htm](http://www.kdheks.gov/labs/lab_ref_guide.htm)

# Contact information

- Epidemiology
  - 1.877.427.7317
  - [epihotline@kdheks.gov](mailto:epihotline@kdheks.gov)

